

**CLAIMS**

What is claimed is:

1. A method for forming a flip chip interconnection structure, comprising providing a first member on an IC chip and a second member on a substrate, the first member comprising a deformable material having a low yield strength and a high elongation to failure and the second member having surface asperities on the part to be bonded with the first member; and

pressing the first and second members against one another using a force sufficient to cause plastic flow of part of the first member into asperities on the second member.

2. The method of claim 1 wherein the first member is a bump formed on the IC chip.

3. The method of claim 1 wherein the deformable material of the first member comprises gold.

4. The method of claim 1 wherein the second member is a surface pad.

5. The method of claim 1 wherein the second member is a lead.

6. The method of claim 1 wherein the second member is a via opening.

7. The method of claim 1 wherein the second member has a plated finish.

8. The method of claim 1, said bump comprising one of a set of such bumps.

9. A flip chip interconnection structure made by the method of claim 1.

10. A flip chip interconnection structure, comprising  
a first member attached to a chip and a second member attached to a substrate,  
the first member being of a deformable material and the first and second members  
being bonded by mechanical interlocking of the deformable material of the first member  
with asperities on the surface of the second member.

11. The flip chip interconnection structure of claim 10 wherein the first member  
comprises a bump formed on the chip.

12. The method of claim 10 wherein the deformable material of the first member  
comprises gold.

13. The method of claim 10 wherein the second member comprises a surface  
pad.

14. The method of claim 10 wherein the second member comprises a lead.

15. The method of claim 10 wherein the second member comprises a via  
opening.

16. The method of claim 10 wherein the second member has a plated finish.

17. The method of claim 10, said bump comprising one of a set of such bumps.